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WHAT IS CLAIMED IS:

1. A system for processing a semiconductor substrate at an elevated temperature, the system comprising:

a processing chamber for processing the semiconductor substrate;

a gas supply configured to inject gas into the processing chamber;

a heating unit configured to provide heat to the semiconductor substrate during processing, the heating unit comprising a doped ceramic heating element at least partially embedded in an undoped ceramic material; and

wherein the coefficient of thermal expansion of the doped ceramic heating element is substantially the same as the coefficient of thermal expansion of the undoped ceramic material.

- 2. The system of claim 1, wherein the doped ceramic heating element and the undoped ceramic material comprise silicon carbide.
- 3. The system of claim 2, wherein the dopant of the doped ceramic heating element comprises nitrogen.
- 4. The system of claim 3, wherein the dopant level of nitrogen within the doped ceramic heating element is between about 150 and 2000 ppm.
- 5. The system of claim 2, wherein the doped ceramic heating element is at least partially embedded in the undoped ceramic material to form a monolithic plate.
 - 6. The system of claim 5, wherein the plate comprises a susceptor for supporting the semiconductor substrate during processing.
 - 7. The system of claim 5, wherein the plate includes at least one substantially oval shaped aperture formed therein for allowing passage of a substrate support pin, the substantially oval shaped aperture having a major axis

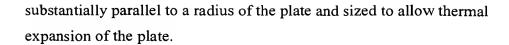
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- 8. The system of claim 1, wherein the doped ceramic heating element forms a continuous electrical path, and wherein the undoped ceramic material holds the doped ceramic heating element in a fixed shape.
- 9. The system of claim 8, wherein the continuous electrical path comprises a plurality of concentric loops that alternate direction.
- 10. The system of claim 1, wherein the doped ceramic heating element is completely embedded within the undoped ceramic material.
- 11. The system of claim 10, wherein the undoped ceramic material provides a conductive heat path between adjacent portions of the doped ceramic heating element.
- 12. The system of claim 1, wherein the doped ceramic heating element and the undoped ceramic material comprise at least one of aluminum oxide, boron nitride and silicon nitride.
- 13. The system of claim 1, wherein the dopant of the doped ceramic heating element comprises at least one of boron, arsenic, antimony and phosphor.
- 25 14. The system of claim 1, wherein the doped ceramic heating element has an electrical resistivity ranging from about 2 to about 5 orders of magnitude less than the electrical resistivity of the undoped ceramic material.
 - 15. A resistive heater for heating a semiconductor processing chamber, the resistive heater comprising:
 - a doped ceramic heating element shaped to form at least one continuous electrical path;

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an undoped ceramic material encasing at least a portion of the doped ceramic heating element to form a monolithic plate; and

wherein the coefficient of thermal expansion of the doped ceramic heating element is substantially the same as the coefficient of thermal expansion of the undoped ceramic material.

- 16. The resistive heater of claim 15, wherein the doped ceramic heating element and the undoped ceramic material comprise silicon carbide.
- 17. The resistive heater of claim 16, wherein the dopant of the doped ceramic heating element comprises nitrogen.
 - 18. The resistive heater of claim 17, wherein the dopant level of nitrogen within the doped ceramic heating element is between about 150 and 2000 ppm.
 - 19. The resistive heater of claim 15, wherein the plate comprises a susceptor configured to support a semiconductor substrate during processing.
 - 20. The resistive heater of claim 15, wherein the plate includes at least one substantially oval shaped aperture formed therein for allowing passage of a substrate support pin, the substantially oval shaped aperture having a major axis substantially parallel to a radius of the plate and sized to allow thermal expansion of the plate.
- 21. The resistive heater of claim 15, wherein the continuous electrical path comprises a plurality of concentric loops that alternate direction.
 - 22. The resistive heater of claim 15, wherein the doped ceramic heating element is completely encased within the undoped ceramic material.
 - 23. The resistive heater of claim 15, wherein the doped ceramic heating element and the undoped ceramic material comprise at least one of aluminum oxide, boron nitride and silicon nitride.

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- 24. The resistive heater of claim 15, wherein the dopant of the doped ceramic heating element comprises at least one of boron, arsenic, antimony and phosphor.
- 25. The resistive heater of claim 15, wherein the thickness of the resistive heater ranges from about 0.1 to about 0.3 inches.
- 26. The resistive heater of claim 15, wherein the doped ceramic heating element has an electrical resistivity ranging from about 2 to about 5 orders of magnitude less than the electrical resistivity of the undoped ceramic material.
 - 27. The resistive heater of claim 15, wherein the doped ceramic heating element forms at least two separate electrical paths to provide at least two separate heating zones.
 - 28. A method of making a resistive heater for use in fabricating integrated circuits at an elevated temperature, the method comprising:

removing a portion of a doped silicon carbide layer to form at least one continuous electrically conductive trace; and

after the step of removing, forming a layer of undoped silicon carbide over at least a portion of the at least one trace to form a monolithic plate.

- 29. The method of claim 28, wherein the step of removing comprises plunge cutting the portion of a doped silicon carbide layer.
- 30. The method of claim 28, wherein the step of removing comprises electric discharge machining the portion of a doped silicon carbide layer.
- 31. The method of claim 28, wherein the step of removing comprises etching the portion of a doped silicon carbide layer.

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- 32. The method of claim 28, further comprising depositing silicon carbide and a dopant on a first layer of undoped silicon carbide to form the layer of doped silicon carbide.
- 5 33. The method of claim 32, wherein the dopant comprises nitrogen.
 - 34. The method of claim 28, further comprising:
 depositing silicon carbide and a dopant on a graphite support to form the layer of doped silicon carbide; and
 - removing the graphite support after forming the layer of undoped silicon carbide.
 - 35. The method of claim 34, further comprising forming a second layer of undoped silicon carbide over the at least one trace to completely encapsulate the at least one trace.